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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/560,525

03/14/2006

Jurgen Schulz-Harder

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6395

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7590

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EXAMINER

CAZAN, LIVIUS RADU

ART UNIT

PAPER NUMBER

3729

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/560,525	Applicant(s) SCHULZ-HARDER ET AL.	
	Examiner LIVIOUS R. CAZAN	Art Unit 3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-45,49 and 51 is/are pending in the application.
- 4a) Of the above claim(s) 30,33,35,40 and 49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31,32,34,36-39,41-45 and 51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment/Arguments

1. The declaration under 37 CFR 1.132 filed 3/21/2011 is insufficient to overcome the rejection of claims 31, 32, 34, 36-39, 41, 42, 45, and 51 as set forth in the last Office action. In particular, the declaration attempts to explain the technical reasons as to why the claimed ranges are important in the claimed process. To summarize, the Declaration essentially states that care must be taken so that there is no combined weakening of the ceramic substrate, from both the applying of the metallization and the formation of the break lines. This can be avoided if the metal areas are sufficiently far from each other.

2. However, the Declaration and the arguments fail to address one point raised by the Examiner in section 10, on page 5 of the Office Action mailed on 9/21/2010. Particularly, the Examiner argued that the specification implies lack of criticality of the claimed ranges, because the claimed ranges appear exemplary. Refer to paragraphs [0030] and [0031] in the specification. A thickness of the ceramic layer of between 0.1 and 3 mm equates to a 30 times larger thickness at the upper end of the range than at the lower end. The thickness of the metal areas is 300 times larger if 0.6 mm than if 0.002 mm. The distance between metal areas is 30 times larger if it is 3 mm than when it is 0.1 mm. The cited paragraphs explicitly refer to these dimensions as being examples, and state that the various dimension depend on how the metal areas are produced. Such large differences between a lower end of the ranges and their respective upper end implies a lack of criticality. Moreover, the Declaration attempts to

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correlate the distance between the metal areas with the thickness of the metal areas (see paragraph 8, last 6 lines). However, the specification discusses these two dimensions separately (in the above-mentioned paragraphs), without stating anything about choosing the distance between metal areas based on the thickness of the metal areas. The fact that the difference in values between one end and the other of the respective ranges is so great supports the opinion of obviousness and suggests the lack of criticality of the claimed ranges. The rejections are therefore maintained.

Claim Objections

3. **Claims 31, 32, 34, 36-39, 41-45, and 51** are objected to because of the following informalities:

4. In claim 41, second line, "is formed" should read --formed--, as in the previous version of the claims.

5. In claim 41, third line, "or" should read --for--, as in the previous version of the claims.

6. In claim 43, "both surface sides" should read --each surface side--.

7. In claim 44, lines 2 and 3, "that a plurality of metal areas, each allocated to one single substrate, are provided" should read --a plurality of metal areas, each allocated to one single substrate, being provided--

8. In claim 44, lines 3 and 4, "and that the break-off lines are" should read-- the break-off lines being--

9. In claim 51, line 15, it is believed "0.02" was intended to read --0.002--, as per the recitation in paragraph [0030] of the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 103

10. **Claims 31, 32, 34, 36-39, 42-45, and 51** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kondratenko (US5609284), Schulz-Harder '221 (US6207221) and Schulz-Harder '592 (US6638592).

11. Kondratenko discloses a method in which a ceramic layer (1; see col. 11, Ins. 39-42) is progressively heated, in a thermal treatment process, in order to produce separating or break-off lines (4), wherein the heating of the ceramic layer during the thermal treatment or process step takes place without vaporization or burning off the ceramic material in a treatment area (2) that moves in relation to the ceramic layer, and, after the heating process, the ceramic is progressively shock-cooled so that a controlled fracture or weakening of material is effected in the ceramic layer in order to produce the separating or break-off line (4). See col. 3, Ins. 41-53 and first 7 lines of the abstract. The heating of the ceramic layer during the thermal treatment or process step is effected by means of a laser beam (2; see col. 5, Ins. 49-67) focused in order to form an oval focus (see 2 in Figs. 1 and 4), with its greater cross-section axis oriented in the processing direction. A break-off line (4) is produced in the ceramic layer by means of the thermal treatment or process step, enabling subsequent controlled mechanical breaking of the ceramic layer. The cooling of the ceramic layer is effected with a fluid coolant stream (3; see col. 6, Ins. 5-18) progressively and point by point at a pre-defined spatial and temporal distance from the heating. The thermal treatment is effected along a groove (4) produced on at least one surface side of the ceramic layer.

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12. However, Kondratenko does not disclose applying this technique to a ceramic layer having a thickness between 0.1 and 3 mm and to which a metallization forming a plurality of individual metal areas has been applied on each surface, the individual metal areas being at a distance from one another, whereby break-off lines are produced between the metal areas so as to separate the substrate into multiple single substrates, the metal areas having a thickness between 0.02 and 0.6 mm, and being at a distance between 0.1-3 mm from each other and at 0.05 - 1.5 mm from a break line, the ceramic layer being selected from the mullite group, Al_2O_3 , AlN , Si_3N_4 , SiC , BeO , TiO_2 , ZrO_2 , or Al_2O_3 with a ZrO_2 content.

13. Schulz-Harder '221 discloses (see Figs. 1-3) a metal-ceramic substrate having an AlN (col. 2, Ins. 1-3) ceramic layer (2a) with a thickness of 0.2 to 2 mm (see col. 2, Ins. 1-6 and 21-25) having individual metal areas 3 with a thickness of 0.1 to 6 mm (see col. 2, Ins. 21-29). Individual substrates are produced by breaking the larger substrate into individual substrates along scored lines (8). The metal areas are applied by direct copper bonding (col. 2, Ins. 21-25).

14. Schulz-Harder '592 discloses (see Figs. 1-3) a metal-ceramic substrate having an AlN (col. 2, Ins. 59-62) ceramic layer (2) having individual metal areas 3, 4 with a thickness of 0.15 to 1.0 mm (see col. 4, Ins. 22 and 23). Individual substrates are produced by breaking the larger substrate into individual substrates along scored lines (7, 8). The metal areas are applied by direct copper bonding (ln. 65 in col. 2 to ln. 1 in col. 3), are at a distance 0.05 to 1 mm from a break line (see col. 4, Ins. 25 and 26; see

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dimension d_1 in Fig. 3), and, therefore, at a distance of 0.1 to 2 mm from each other (i.e. $2 \times d_1$).

15. At the time the invention was made, it would have been obvious to one of skill in the art to utilize the method of Kondratenko to separate a larger substrate such as the claimed substrate and that of Schulz-Harder '221 and '592 into individual substrates, since the process of Kondratenko provides an alternative method of producing separating lines for separating a large substrate into smaller substrates. One of ordinary skill in the art would have been motivated to do so for the advantages the technique of Kondratenko provides over the conventional methods, such as, for example, increased cutting speed. See col. 5, lns. 20-23 in Kondratenko. Note that in applying the method of Kondratenko to a substrate as claimed, the laser would heat only the ceramic layer in the area in between metal areas, along the break lines, not in other areas where a break is not intended to occur.

16. Additionally, regarding the particular dimensions claimed, attention is directed to paragraphs [0030] and [0031] of the specification. It is readily apparent from these paragraphs that the claimed dimensions are merely exemplary. The disclosure does not reveal any criticality to the claimed metal and substrate thickness, or the spacing between metal areas. The substrate and metal thicknesses discussed in these paragraphs are mere examples, not specific dimensions absolutely necessary for a proper functioning of the invention. From the two Schulz-Harder references, it is readily apparent that the claimed metallization thickness, the claimed substrate thickness, the claimed spacing between metal areas, and the claimed distance between a metal area

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and a break line are all conventional in the art. Therefore, at the time the invention was made, one of ordinary skill in the art would have found it obvious to apply the method of Kondratenko to a metal-ceramic substrate having the claimed dimensions, because there is nothing critical about the claimed dimensions. Kondratenko is applicable to various non-metallic bodies, and picking a substrate to which to apply this technique would require only routine skill in the art.

17. **Claim 41** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondratenko, Schulz-Harder '221, and Schulz-Harder '592, in view of AAPA (Applicant's admitted prior art).

18. Kondratenko and the two Schulz-Harder references disclose substantially the claimed invention, as discussed above, except for the ceramic layer being located on a self-adhesive foil for separation into single substrates.

19. In the Office Action mailed on 6/3/2009, the Examiner took Official Notice of the fact that it is very well known to use an adhesive foil, such as blue foil, to hold a substrate which is to be separated into individual smaller substrates, and argued it would have been obvious to one of ordinary skill in the art to utilize such a tape with the ceramic layer of Kondratenko and Schulz-Harder, in order to facilitate the separation of the ceramic layer into individual substrates, as in the conventional art.

20. Since Applicant failed to traverse the examiner's assertion of Official Notice, it was taken to be admitted prior art, in the Office Action mailed on 3/1/2010, and is relied upon as such in the present Action. It is deemed it would have been obvious to one of ordinary skill in the art at the time the invention was made, to utilize a foil as claimed

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with the substrate of Kondratenko, Schulz-Harder '221, and Schulz-Harder '591, for the same reasons mentioned above and stated in the Office Action mailed on 6/3/2009. See MPEP 2144.03(C), second paragraph.

Conclusion

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIVIUS R. CAZAN whose telephone number is (571)272-8032. The examiner can normally be reached on M-F 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DERRIS H. BANKS can be reached on (571) 272-4419. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LIVIOUS R CAZAN/ 6/5/2011
Primary Examiner, Art Unit 3729